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New addition to the scorpion fauna (Arachnida: Scorpiones) of Sri Lanka*

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New addition to the scorpion fauna (Arachnida: Scorpiones) of Sri Lanka. - In this paper we present results of the study of a collection of scorpions from Sri Lanka, now deposited in the Natural History Museum, Geneva. This collection comprises 3 families, 3 genera and 7 species. A new species *Isometrus (Reddyanus) garyi* sp. n. and a new subspecies *Isometrus (Isometrus) thwaitesi pallidus* ssp. n. (Buthidae) are described. *Isometrus (Reddyanus) loebli* Vachon and *Heterometrus (Gigantometrus) swammerdami titanicus* Couzijn are raised to species rank.

Key-words: scorpion - Sri Lanka - new species - new subspecies - *Isometrus*.

INTRODUCTION

Studies on the scorpions of Sri Lanka, formerly Ceylon, began in the second half of the 19th century but, in most cases, these are isolated descriptions (Karsch, 1879, 1891; Pocock, 1894, 1897, 1899; Kraepelin, 1913). The first comprehensive study of the scorpions of India and Ceylon, which also included Burma, was published by Pocock (1900). Subsequently, other contributions to the knowledge of the fauna of the region have been made, but they are mainly concerned with India (Sreenivasa-Reddy, 1970; Tikader & Bastawade, 1983). Vachon (1982) made a specific study on the scorpions of Sri Lanka, in which, however, he left several species undetermined. Doubts concerning the species of *Lychas* actually present in Sri Lanka have recently been clarified (Lourenço, 1997; Lourenço & Huber, 1999). The status of certain species of the genus *Isometrus*, nevertheless remained unclear.

Among the additions to our knowledge of the scorpion fauna of Sri Lanka discussed in the present paper, one new species and one new subspecies of *Isometrus* are described. The exact composition of the genus *Isometrus* worldwide is not yet known precisely. Sissom (1990) indicated a total of 15 species for the two recognized sub-genera. In their Catalog of the Scorpions of the World, Fet & Lowe (2000) listed 20 congeneric species, one of them with two subspecies. New species were described by Kovarik (1994, 1997, 1998), but these require confirmation. Most authors agree

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that the taxonomy of the genus *Isometrus* remains confused (Fet & Lowe, 2000), even though the status of certain species has recently been clarified. All the specimens studied here are deposited in the collections of the Muséum d'histoire naturelle, Geneva.

BUTHIDAE C. L. Koch, 1837

Isometrus Ehrenberg, 1828

Isometrus (Isometrus) maculatus (DeGeer, 1778)

Material examined: SRI LANKA: Anuradhapura District, Padaviya, antiquities site, 20-23/VII/1978 (K.V. Krombein, T. Wijesinhe, L. Jayawickrema, V. Kulaselare), 1 female; Padaviya Tank, 70 m, 11-14/X/1977 (K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, M. Jayaweera), 1 female; Wildlife Soc. Bungalow, Hunuwilagama, Wilpattu, 10-19/III/1970, 200 ft (Davis & Rowe)?; Mannar District, 0.5 Mi NE Kokmottre Wilpattu National Park, 15-16/II/1979 (K.V. Krombein, T. Wijesinhe, S. Siriwardane, T. Gunawardane), 1 female, 13 juveniles; Matale District, Sigiwiya, 17/VI/1971 (W. Messersmith), 1 female; Marichchikaddy, 27/XI/1974 (H. Prassana & Farook), 1 female; Uggal Kalkota, East coast, 15/II/1971 (P.O. Karunaratne), 1 male.

Note: *Isometrus maculatus* is the most widely distributed scorpion in the world. Its distribution has anthropogenical background, probably going back to the great naval voyages of the 16th century. *I. maculatus* is found in most tropical and subtropical coastal regions of the world. The question remains, however: What is the original area of distribution of this species? We suggest here that it could be Sri Lanka. This is the only region in the world where *I. maculatus* is found in really wild conditions inland.

Isometrus (Isometrus) thwaitesi pallidus ssp. n. Figs 1-7

Type material: 1 female holotype, SRI LANKA: Mannar District, Wilpattu National Park, O.5 Mi. NE Cockmuttai, 20m, 6-7/X/1977 (K.V. Krombein, P.B. Karunaratne, T. Wijesinhe & M. Jayaweera).

Etymology: The name makes reference to the very pale coloration of this sub-species.

Diagnosis: The new sub-species can be distinguished from *Isometrus (Isometrus) thwaitesi* Pocock by the following characters:

- Coloration: The new species is generally of a paler yellow; chela and vesicle are yellowish with pale brownish spots, whereas in *I. (I.) thwaitesi thwaitesi* they are black with yellow spots.

- Pectinal teeth counts in the new sub-species show a smaller number of teeth than in specimens of *I.(I.) thwaitesi thwaitesi* (see Vachon, 1982), and the basal middle lamella is less dilated.

Description based on female holotype:

Morphometric measurements (in mm). Total length 37,0; Carapace: length 3.9, anterior width 2.8, posterior width 3.9; Metasomal segment I: length 2.8, width 1.8; Metasomal segment V: length 5.2, width 1.4, depth 1.5; Vesicle: width 1.3, depth 1.3; Pedipalp: Femur length 3.8, width 1.1; Tibia length 4.5, width 1.7; Chela length 7.0, width 1.4, depth 1.3; Movable finger: length 5.0.

Coloration. Generally pale yellow with several variegated spots or pigmented zones on the body and its appendages. Prosoma: carapace yellowish with variegated spots; eyes surrounded by black pigment. Mesosoma: yellowish with 3 longitudinal dark stripes. Metasoma: all segments yellowish with pale brown variegated spots. Vesicle yellowish with pale brown spots; aculeus yellowish at the base and reddish at its extremity. Venter pale yellow. Chelicerae yellowish with brownish variegated spots; teeth reddish. Pedipalps: yellowish throughout, with pale brown variegated spots; rows of granules on dentate margins of the fingers reddish. Legs yellow with pale brown variegated spots.

Morphology. Prosoma: Anterior margin of carapace moderately emarginate. Carapace carinae moderately developed; central median and posterior median carinae moderately developed; anterior median carinae, central lateral and central median carinae moderately developed; posterior median carinae weak. Intercarinal spaces weakly granular, almost smooth centrally. Median ocular tubercle anterior to the center of the carapace; median eyes separated by 1.5 ocular diameters. Three pairs of lateral eyes. Mesosoma: tergites I-VI with a median carinae, weak on I, moderately developed on II-VI. Tergite VII pentacarinate, with lateral pairs of carinae moderate to strong; median carinae present in proximal half, moderately developed. Intercarinal spaces moderately granular. Sternites almost smooth. Pectines moderately long; pectinal teeth count 13-14. Metasoma: Segment I with 10 keels, crenulate; II-IV with 8 keels. Dorsolateral carinae moderately developed. Segment V with 5 keels. Dorsal furrows of all segments weakly developed, smooth; intercarinal spaces weakly granular. Telson weakly granular, with one lateral carina; subaculear tubercle strong and spinoid. Chelicerae with dentition characteristic of buthids (see Vachon, 1963). Pedipalps: Trichobothrial pattern orthobothriotaxic, type A (see Vachon, 1974); dorsal trichobothria of femur in Beta configuration (see Vachon, 1975). Femur pentacarinate; all carinae moderately crenulate. Tibia with 7 keels; all carinae weakly to moderately developed; dorsointernal carinae with 4 spinoid granules. Chelae slender, with elongated fingers; all carinae weakly granular. Dentate margins on movable and fixed fingers composed of 7 linear rows of granules. Legs: Ventral aspect of tarsi with a brush-like group of setae. Tibial spurs absent; pedal spurs present and moderately developed on legs III-IV.

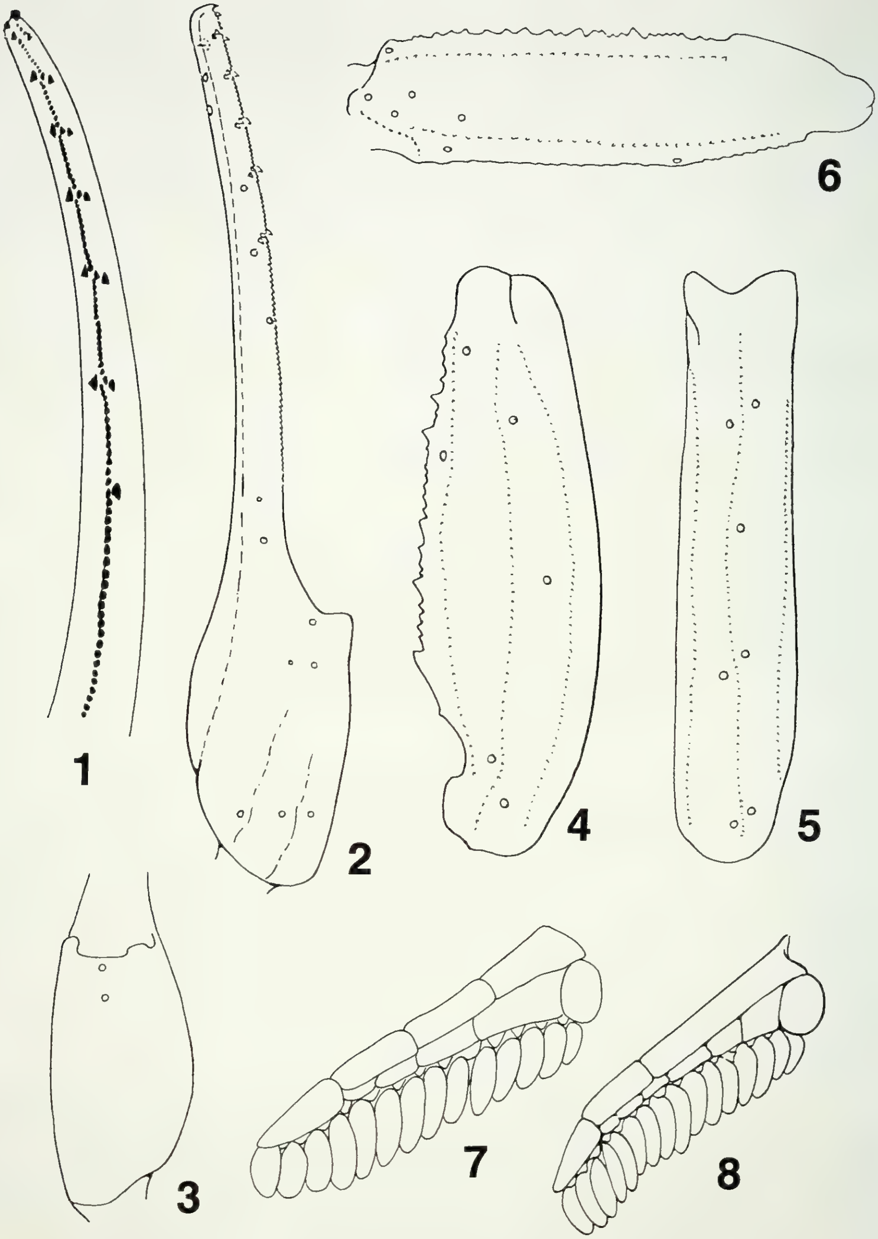
Isometrus (Reddyanus) besucheti Vachon, 1982

Material examined: SRI LANKA: Anuradhapura District, NW Coast of Nuwara Wewa, under a stack of bricks in a dry area, 14/II/2000 (D. Huber), 3 females; Galle District, Kanneliya, Sinharaja Forest Reserve, 24-26/I/1979 (K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, S. Siriwardane, T. Gunawardane), 1 female. Polonnaruwa District, Minneriya to Habarana, Minneriya Giritale Sanctuary, under bark of rotten tree, dry jungle vegetation, 18/II/2000 (D. Huber); 1 male, 1 juvenile male, 2 females.

Isometrus (Reddyanus) loebli Vachon, 1982, stat. n.

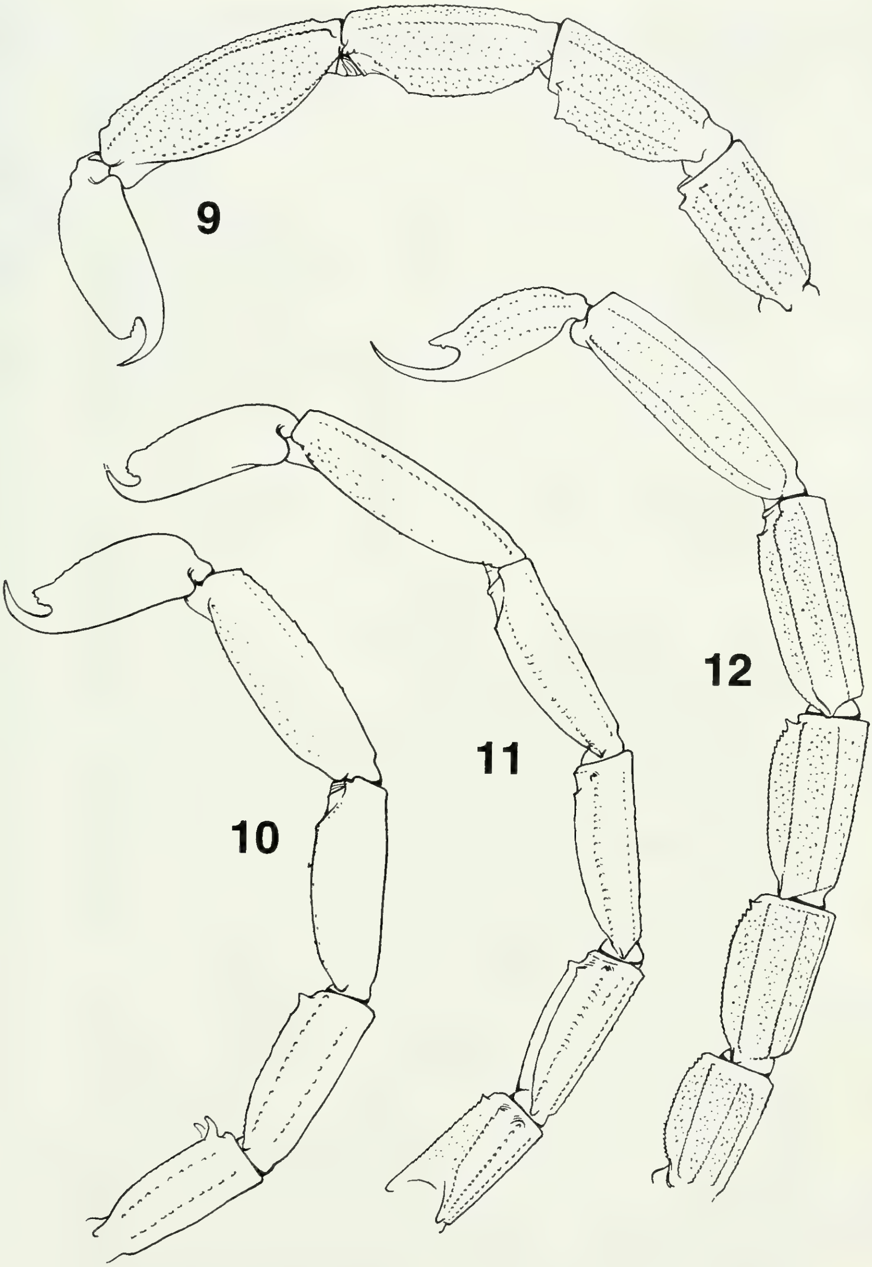
Material examined: SRI LANKA: Anuradhapura District, Irrigation Bungalow, Padaviya, 180ft, 27/II-9/III/1970 (Davis & Rowe), 1 male, 2 females, 1 male juvenile.

Note: Vachon (1982) defined this form as a subspecies of *I. (R.) acanthurus* Pocock, which only occurs in India. The form in Sri Lanka possesses two strong



Figs 1-8

1-7. *Isometrus (Isometrus) thwaitesi pallidus* ssp. n. (female holotype). 1. Disposition of granulations on the dentate margins of the pedipalp-chela movable finger. 2-6. Trichobothrial pattern. 2-3. Chela, dorso-external and ventral aspects. 4-5. Tibia, dorsal and external aspects. 6. Femur, dorsal aspect. 7. Pecten. 8. Idem for *Isometrus (Isometrus) thwaitesi thwaitesi* (female).



Figs 9-12

Metasoma and telson, lateral aspect. 9. *Isometrus (Reddyanus) besucheti* (male). 10. *Isometrus (Reddyanus) loebli* (male). 11. *Isometrus (Reddyanus) basilicus* (male). 12. *Isometrus (Isometrus) thwaitesi thwaitesi* (female) (from Vachon, 1982).

spines on the dorsal carinae of only metasomal segment II, whereas in the Indian form these spines are also present on segment III. Taking into account this important difference and also the insular isolation of the Sri Lanka form, we raise it to specific rank.

Isometrus (Reddyanus) garyi sp. n. Figs 13-18

Type material: SRI LANKA: 1 juvenile female (holotype), 1 juvenile male (paratype), Mannar District, beside an irrigation canal, Madhu Road, 50 ft. 23/III/1970 (Davis & Rowe).

Etymology: The specific name is in honor of Gary Polis, in recognition of his contribution to scorpion ecology.

Diagnosis: The new species is close to *Isometrus (R.) besucheti* Vachon, but is distinguishable from this species by the following characters: (i) coloration: generally yellowish; carapace heavily spotted with brown; tergites with 3 longitudinal brown stripes; metasomal segments spotted only in their distal portions, except for a completely totally brown segment V. Pedipalp tibia spotted with brown; chela hand yellow, fingers brown. In contrast *I. (R.) besucheti* is yellowish and variegated with brown spots throughout, (ii) pectinal teeth counts in the new species show a lower number of teeth (15-15) in the juvenile male examined than in the male specimens of *I. (R.) besucheti* (17-18; see Vachon, 1982), (iii) the subaculear tubercle in the new species is spinoid, whereas in *I. (R.) besucheti* it is stronger and rhomboid.

Description based on female holotype:

Morphometric measurements (in mm). Total length 28,0; Carapace: length 2.4, anterior width 2.0, posterior width 2.8; Metasomal segment I: length 1.3, width 1.4; Metasomal segment V: length 2.7, width 1.3, depth 1.3; Vesicle: width 1.0, depth 1.0; Pedipalp: Femur length 2.0, width 0.8, Tibia length 2.2, width 1.2, Chela length 3.9, width 1.1, depth 0.8; Movable finger: length 2.7.

Coloration. Generally yellow with several spots or pigmented zones on the body and its appendages. Prosoma: carapace yellowish, heavily spotted with brown; eyes surrounded by black pigment. Mesosoma: yellowish with 3 longitudinal brownish stripes. Metasoma: segments I-IV yellowish with a brown ring at posterior end; segment V brownish, vesicle yellowish; aculeus yellowish at the base and reddish at the extremity. Venter pale yellow. Chelicerae yellowish with variegated brown spots; teeth reddish. Pedipalps: yellowish throughout; femur and tibia with large brown spots dorsally; hand of chela yellow, fingers blackish brown. Legs yellowish with widely spaced dark spots.

Morphology. Prosoma: Anterior margin of carapace weakly to moderately emarginate. All carapace carinae weakly developed; central median, posterior median, anterior median, central lateral and central median carinae weak. Intercarinal spaces weakly granular, almost smooth. Median ocular tubercle anterior to the center of the

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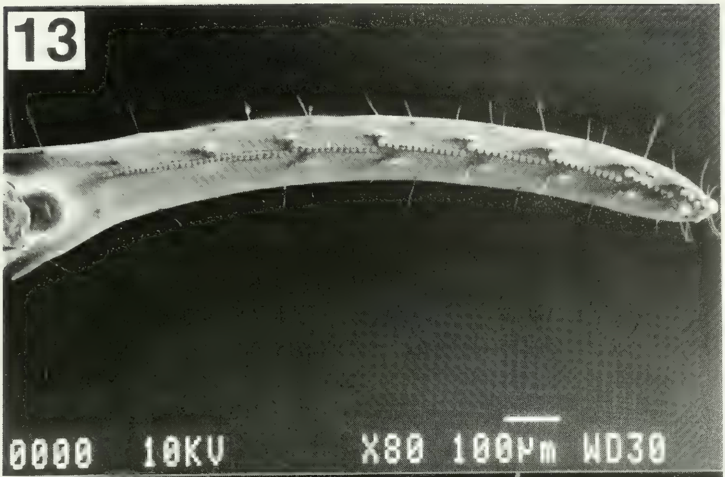
FIGS 13-15

Isometrus (Reddyanus) garyi sp. n. (male paratype). 13. Disposition of granulations on the dentate margins of the pedipalp-chela movable finger. 14. Details on the tip of the movable finger. 15. Metasomal segment V and telson, lateral aspect.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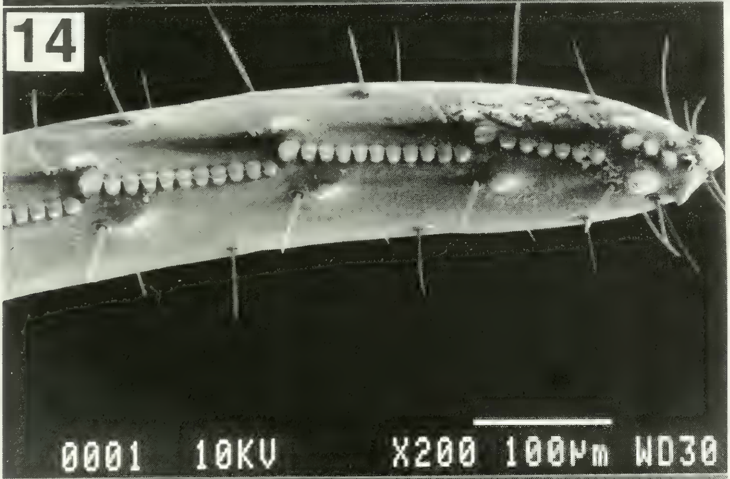
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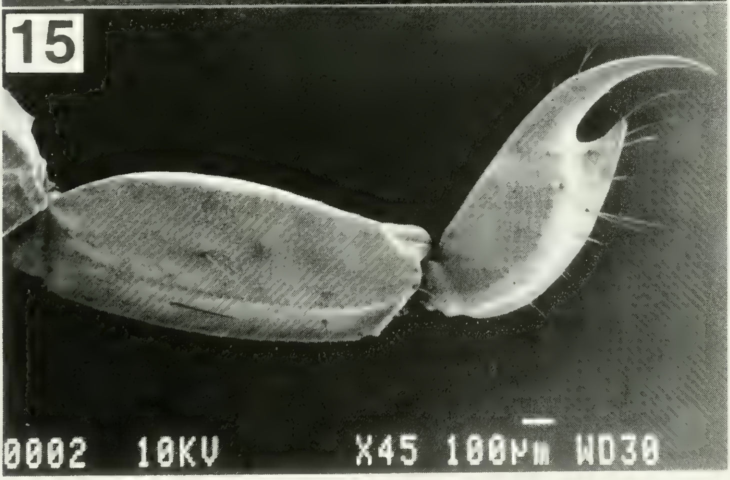
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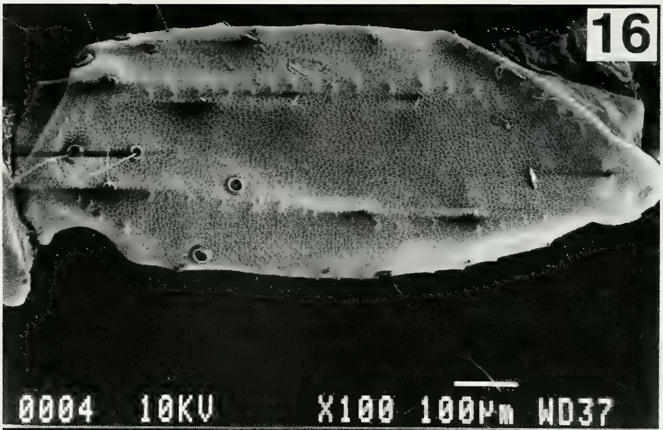
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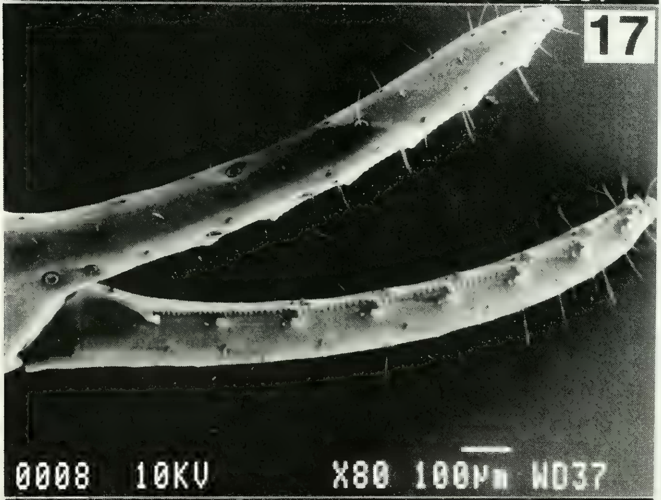
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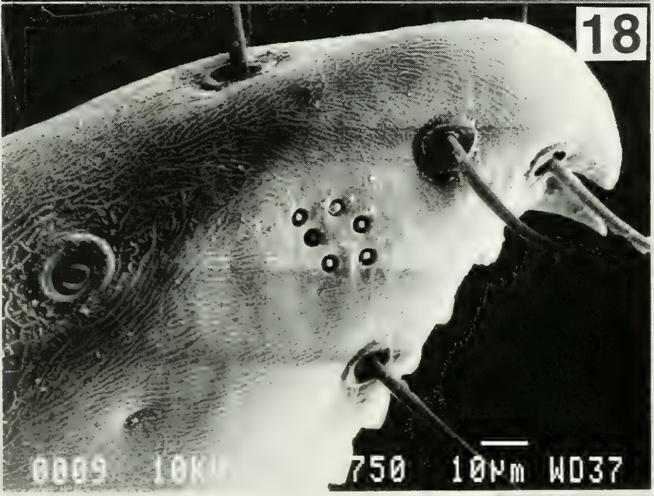
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carapace; median eyes separated by 1.5 ocular diameters. Three pairs of lateral eyes. Mesosoma: Tergites I-VI with a median carina, weak on I, moderate on II-VI. Tergite VII pentacarinate, with lateral pairs of moderately developed carinae; median carinae present in proximal half, moderately developed. Intercarinal spaces weakly granular. Sternites smooth. Pectines moderately long; pectinal teeth count 15-14 (male 15-15). Metasoma: Segment I with 10 keels, crenulate; II-IV with 8 keels. Dorsolateral carinae moderate to strong, terminating distally in an enlarged denticle, most pronounced on II-III. Segment V with 5 keels; ventromedian carinae weak. Dorsal furrows of all segments moderately developed, smooth; intercarinal spaces weakly granular. Telson weakly granular. Subaculear tubercle strong and rhomboid. Chelicerae with dentition characteristic of buthids (see Vachon, 1963). Pedipalps: trichobothrial pattern orthobothriotaxic, type A (see Vachon, 1974); dorsal trichobothria of femur in Beta configuration (see Vachon, 1975). Femur pentacarinate; all carinae moderately crenulate. Tibia with 7 keels; all carinae weak to moderately developed; dorsointernal carinae with some weak spinoid granules. Chelae short, with moderately elongated fingers; all carinae weakly granular. Dentate margins on movable and fixed fingers composed of 6-7 linear rows of granules. Legs: Ventral aspect of tarsi with a brush-like group of setae. Tibial spurs absent; pedal spurs present and moderately developed on legs III-IV.

CHAERILIDAE Pocock, 1893

Chaerilus Simon, 1877

Chaerilus ceylonensis Pocock, 1894

Material examined: SRI LANKA : Ciretale, 9/III/1992 (N. Haug), 1 female pre-adult.

SCORPIONIDAE Latreille, 1802

Heterometrus Ehrenberg, 1828

Heterometrus (Gigantometrus) titanicus Couzijn, 1981, stat. n.

Material examined: SRI LANKA: Anuradhapura District, Padaviya, antiquities site, 20-23/VII/1978 (K.V. Krombein, T. Wijesinhe, L. Jayawickrema V. Kulasekare), 1 male. Hambantota District, Palutapana, 10-12/VIII/1972 (K.V. Krombein, P.B. Karunaratne), 1 male, pre-adult. Kandy District, Udawahekele, Sanctuary Kandy, 6-8/VI/1978 (K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, V. Kulasekane, L. Jayawickrema), 2 males. Matale District, Dumbulla-Kandy Road, night-sed, 12/X/1973 (M.& B. Robinson), 1 female pre-adult. Ratnapura District, Panamure, 500m, 15-21/X/1970 (O.S. Flint Jr.), 1 male, juvenile.

Note: This form was originally described as a sub-species of *Heterometrus (Gigantometrus) swammerdami* (Simon, 1872) which lives exclusively in India. Taking into account the morphological differences proposed by Couzijn (1981), and the insular isolation of this population, we raise *H. (G.) titanicus* to specific rank.

Figs 16-18

Isometrus (Reddyanus) garyi sp. n. (male paratype). 16. Femur, dorsal aspect, showing internal, external and dorsal trichobothria; note the Beta configuration for dorsal. 17. Fixed and movable fingers of pedipalp chela; note trichobothria. 18. Detail of the tip of the pedipalp chela fixed finger.

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REFERENCES

COUZIJN, H. W. C. 1981. Revision of the genus *Heterometrus* Hemprich & Ehrenberg (Scorpionidae, Arachnidea. *Zoologische verhandelingen* 184: 1-196.

FET, V. & LOWE, G. 2000. Family Buthidae C. L. Koch, 1837. *In*: FET, V., SISSOM, W. D., LOWE, G. & BRAUNWALDER, M. E. (eds). Catalog of the Scorpions of the World (1758-1998). *New York, NY: The New York Entomol. Society*: 54-286.

KARSCH, F. 1879. Scorpionologische Beiträge. Part I. *Mitteilungen des Münchener entomologischen Vereins* 3: 6-22.

KARSCH, F. 1891. Arachniden von Ceylon und von Minikoy gesammelt von den Herren Doctoren P. und F. Sarasin. *Berliner entomologische Zeitschrift* 36(2): 267-310.

KOVARIK, F. 1994. *Scorpiops irenae* sp. n. from Nepal and *Scorpiops hardwickei jendeki* subsp. n. from Yunnan, China (Arachnida: Scorpionida: Vaejovidae). *Acta Societatis Zoologicae Bohemoslovenicae* 58: 61-66.

KOVARIK, F. 1997. *Isometrus (Reddyanus kurkai* sp. n. from Indonesia (Scorpiones, Buthidae). *Casopis Narodniho muzea Rada prirodovedna* 166 (1-4): 5-10.

KOVARIK, F. 1998. *Isometrus (Reddyanus) krasenskyi* sp. n. from Indonesia and *I.(R.) navaiae* sp. n. from the Philippines (Scorpiones: Buthidae). *Acta Societatis Zoologicae Bohemoslovenicae* 62: 35-40.

KRAEPELIN, K. 1913. Neue Beiträge zur Systematik der Gliederspinnen. III. A. Bemerkungen zur Skorpionenfauna Indiens. B. Die Skorpione, Pedipalpen und Solifugen Deutsch-Ost-Afrikas. *Mitteilungen aus dem Naturhistorischen Museum* (2. *Beiheft zum Jahrbuch der Hamburgischen wissenschaftlichen Anstalten*, 1912) 30: 123-196.

LOURENÇO, W. R. 1997. A new species of *Lychas* Koch, 1845 (Chelicerata, Scorpiones, Buthidae) from Sri Lanka. *Revue suisse de Zoologie* 104 (4): 831-836.

LOURENÇO, W. R. & HUBER, D. 1999. Another new species of *Lychas* Koch, 1845 (Chelicerata, Scorpiones, Buthidae) from Sri Lanka. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg* 13 (159): 23-27.

POCOCK, R. I. 1894. A small contribution to our knowledge of the scorpions of India. *Annals and Magazine of Natural History* (6), 13: 72-84.

POCOCK, R. I. 1897. Descriptions of some new species of scorpions from India. *Journal of the Bombay Natural History Society* 11: 102-117.

POCOCK, R. I. 1899. Descriptions of six new species of scorpions from India. *Journal of the Bombay Natural History Society* 12: 262-268.

POCOCK, R. I. 1900. Arachnida. *In*: BLANDFORD, W. T. (ed.). The Fauna of British India, including Ceylon and Burma. *London*, xii + 279 pp.

SISSOM, W. D. 1990. Systematics, biogeography, and paleontology. *In*: POLIS, G. A. (ed.). The biology of scorpions. *Stanford, CA: Stanford University Press*: 64-160.

SREENIVASA-REDDY, R. P. 1970. The systematic position of the scorpion genus *Charmus*. *Journal of the Natural History* 4: 17-23.

TIKADER, B. K. & BASTAWADE, D. B. 1983. The Fauna of India. Vol. 3. Scorpions (Scorpionida: Arachnida). *Zoological Survey of India, Calcutta*, 671 pp.

VACHON, M. 1963. De l'utilité, en systématique, d'une nomenclature des dents des chélicères chez les Scorpions. *Bulletin du Muséum National d'Histoire naturelle, Paris 2è sér.* 35 (2): 161-166.

VACHON, M. 1974. Etude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Muséum National d'Histoire naturelle, Paris, 3è sér.*, n° 140, Zool. 104: 857-958.

VACHON, M. 1975. Sur l'utilisation de la trichobothriotaxie du bras des pédipalpes des Scorpions (Arachnides) dans le classement des genres de la famille des Buthidae Simon. *Comptes Rendus des Séances de l'Académie de Sciences*, Paris, sér. D, 281: 1597-1599.

VACHON, M. 1982. Les scorpions de Sri Lanka (Recherches sur les scorpions appartenant ou déposés au Muséum d'Histoire naturelle de Genève III). *Revue suisse de Zoologie* 89 (1): 77-114.